

What Is Claimed Is:

1. A connector for providing a connection between an opposing connector and a circuit board, the opposing connector having an elongated insertion end for mating with the connector, said connector comprising: an insulative housing supporting a plurality of conductive terminals, the terminals each having contact portions and tail portions, the tail portions extending outwardly and away from the connector housing, the connector housing having a body portion and distinct top and bottom wall portions extending therefrom, the connector housing top and bottom portions being disposed on said body portion to define a space therebetween adapted to receive said opposing connector insertion portion therein, the contact portions of said terminals being disposed in said space and between said top and bottom wall portions, said connector housing not having any sidewalls interconnecting said top and bottom wall portions together such that said connector housing has a generally U-shaped cross-section;

Sub.
A3

a retainer in the form of a metal shield that overlies a portion of said connector housing, the retainer shield having three distinct retention members formed thereon, each of the retention members extending at least partially into said space between said connector housing top and bottom wall portions for engaging opposing portions of said opposing connector inserted into said space, each of said retention members further extending into said space from three different directions; and,

an outer metal shell having a plurality of different panel portions, some of which overlie portions of said connector housing, the shell member having a front face panel that extends vertically between said connector housing top and bottom wall portions, two side panels that extend vertically between said connector housing top and bottom wall portions and close off said space therebetween to define a four sided receptacle of said connector, the front face panel having an opening formed therein that communicates with said receptacle, two of said retention members being disposed interiorly of said side

Sub
A3
conid.

panels and the third of said retention members being disposed interiorly of said connector housing top wall portion.

2. The connector as set forth in claim 1, wherein each of said retention members includes a free end that extends into said space toward said connector housing body portion.

3. The connector as set forth in claim 1, wherein said connector housing top wall member includes an opening formed therein and said third retention member extends through said opening into said receptacle.

4. The connector as set forth in claim 1, wherein said shell include a bottom panel portion integrally formed with said front panel portion.

5. The connector as set forth in claim 4, wherein said shell includes a top panel portion integrally formed with said front panel portion, said top panel portion overlying part of said retainer shield and said connector housing top wall member, said shell side panel portions being integrally formed with said front panel portion, said top and side panel portions being folded along side edges of said connector housing top wall portions.

6. The connector as set forth in claim 1, wherein said shell front panel portion has a frame portion that extends completely around said opening.

7. The connector as set forth in claim 5, wherein said shell includes a bottom panel portion integrally formed with said front panel portion.

8. The connector as set forth in claim 7, wherein said bottom panel portion and said side panel portions include cooperating engagement means.

9. The connector as set forth in claim 8, wherein said bottom panel portion includes a pair of engagement tabs extending outwardly therefrom and each of said side panel portions includes a slot sized to receive one of said engagement tabs, said engagement tabs being received within said side panel portion slots when folded around said connector housing.

10. The connector as set forth in claim 1, wherein said retainer shield is formed from a single metal blank having a top portion and two side portions each of which overlie respective opposing portions of said connector housing body portion, a first of said three retention members being formed as part of said retainer shield top portion and a second and third of said three retention members being formed as parts of said retainer shield side portions.

11. The connector as set forth in claim 10, wherein said retainer shield side portions each include a slot separating said second and third retention members therefrom.

12. The connector as set forth in claim 11, wherein said retainer shield side portion slots engaged projections formed on said connector housing.

13. The connector as set forth in claim 1, wherein one of said three retention members extends downwardly into said space to exert a vertical retention force on said opposing connector when inserted into said receptacle and the other two retention members extend sideways into said space to exert a horizontal retention force on said opposing connector when inserted into said receptacle.

14. The connector as set forth in claim 1, wherein a portion of said outer shell overlies a portion of said retainer shield.

15. The connector as set forth in claim 10, wherein said connector housing top wall portion includes an opening disposed therein that communicates with said receptacle and said first retention member extends through said opening into said space, said first retention member being bent upon itself and extending in said space toward said connector housing

16. The connector as set forth in claim 1, wherein each of said retention members includes a free end that extends in opposition to said connector housing body portion.

17. A receptacle connector for providing electrical connection between an opposing plug connector with a circuit board, the opposing connector having an insertion end for mating with the receptacle of said connector, comprising:

an insulative housing, the connector housing supporting a plurality of conductive terminals, the connector housing having an interior receptacle in which said terminals are supported, the receptacle being sized to receive said plug connector insertion end when said plug connector is mated to said receptacle connector;

*Sub.
A5*

a retainer shield for shielding a portion of said connector housing and for engaging a plurality of exterior surfaces of said plug connector insertion end, the retainer shield including a body portion that is bent to overlie at least three distinct sides of said connector housing, said retainer shield further including at least two retention members formed therewith and projecting into said connector housing interior receptacle, said two retention members being oriented in distinct vertical and horizontal planes so as to exert a retaining force from two different directions on two different surfaces of said plug connector insertion end when inserted into said receptacle.

18. The connector of claim 17, wherein said retainer shield further includes a third retention member formed therewith and projecting into said connector housing interior receptacle, two of said three retention members being oriented to each apply a sideways retaining force on said plug connector insertion end, and the third of said three retention members being oriented to apply a retaining force on a top surface of said plug connector insertion end when inserted into said receptacle.

19. The connector of claim 17, further including an outer shell member disposed on the exterior of said connector housing, said shell member overlying at least four different surfaces of said connector housing and having a front panel portion with an opening formed therein that communicates with said connector housing interior receptacle.

20. The connector of claim 18, wherein said outer shell member overlies a portion of said retainer shield and at least partially retains said retainer shield in place on said connector housing.

Sub.
A^b

21. A connector for providing a connection between an opposing connector and a circuit board, the opposing connector having an elongated insertion end for mating with the connector, said connector comprising:

an insulative housing supporting a plurality of conductive terminals, the connector housing having a body portion with distinct top and bottom wall portions extending therefrom, the connector housing top and bottom portions defining a receptacle therebetween adapted to receive said opposing connector insertion portion therein, said connector housing not having any sidewalls interconnecting said top and bottom wall portions and defining part of said receptacle;

*Sub.
A6
Con'd.*

a retainer shield that overlies a portion of said connector housing, the retainer shield being formed from a metal blank and having three distinct retention members formed therewith, each of the retention members extending at least partially into said receptacle for engaging opposing portion of said opposing connector inserted into said space, each of said retention members further extending into said space from three different directions; and,

an outer metal shell having a plurality of different panel portions disposed on some portions of said connector housing in overlying relationship, the shell member having a front face panel that extends vertically between said connector housing top and bottom wall portions, two side panels that extend vertically between said connector housing top and bottom wall portions and to define, in cooperation with said connector housing top and bottom wall portions, said connector receptacle, the front face panel having an opening formed therein that communicates with said receptacle, two of said retention members being disposed interiorly of said outer shell side panels and the third of said retention members being disposed interiorly of said outer shell and said connector housing top wall portion.